

## Post Occupancy Evaluation of Some Selected Secondary Schools in Minna, Nigeria

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### Abstract

Post Occupancy Evaluation involves systematic evaluation of opinion about buildings in use, through careful analysis of buildings, its facilities and surroundings, from all relevant viewpoints particularly the users of the buildings. It assesses how well buildings match users' needs and assists them in realising the potential and limitations of their buildings. That is, it identifies ways to improve building design, performance and fitness for purpose. Thus, this paper presents the results of research into facilities of secondary schools in Minna, using Post Occupancy Evaluation (POE) approach. Two sets of questionnaires were prepared and administered to the schools' principals and randomly to the teachers and students. The research results indicate that (i) inadequate laboratory and sporting facilities, poor landscaping and overcrowded classrooms are found to be major problems in many schools. (ii) Provisions for sanitary toilet facilities, especially for students in most cases are grossly inadequate and in poor state of disrepair. (iii) the top five well performing schools are all private secondary schools excluding one owned by the Federal Government, while the remaining are State Government owned schools, and (iv) public schools are far less well maintained than private ones. Suggested remedies to these problems were proffered.

**Keywords:** Building Design, Maintenance, Post-Occupancy Evaluation, Secondary School

### 1. Introduction

Buildings are an important necessity to provide for human needs for shelter and support for operations and equipment. Therefore by understanding how existing buildings affect occupants, designers can minimise problems and capitalise on successful design features. Evaluation and feedback are known to be cornerstones for the continuous improvement in building procurement. Thus, for an effective feedback system there is a need for Post Occupancy Evaluation (POE). Post Occupancy Evaluation involves systematic evaluation of opinion about buildings in use, through careful analysis of buildings from all relevant viewpoints, particularly the users of the buildings. It is equally a tool to account for building quality, most especially when planning refurbishment of existing buildings. It helps clarify perceived strengths and weakness in order to focus resources where they are needed.

From past researches carried out (Brill, Wilson & Decker, 1984; Ellis, 1988; Wolfgang, Harvey & Edward, 1988; Van Wagenberg, 1989; Zubairu & Olagunju. 2003), the participation by the users has been found to generate greater commitment to solutions and more willingness of users/owners to accept shortcomings. Consequently, POE of existing buildings involves relevant groups such as architects, engineers, estate surveyors, developers, manufacturers but predominantly users.

There is growing global desire to assess and investigate performance of buildings after being occupied due to its enormous influence on the occupants' health and safety and stakeholders' needs. Accordingly, it is imperative to evaluate the performance of secondary schools in Minna, Niger State, because of its associated effects on the quality of education. Today, it is obvious that as school buildings age, there is the growing challenge of maintaining school facilities at a level that enables teachers to meet the needs of the teeming population of students.

According to the National Centre on Education Statistics 'NCES' (2003) School facilities maintenance affects the physical, educational, and financial foundation of the school organization and should, therefore, be a focus of both its day-to-day operations and long-

range management priorities. In view of this fact, the research focused on the evaluation of the performance of some selected fourteen secondary schools' facilities in Minna. These schools include, (i) Niger Baptist Secondary School (NBSS), (ii) Government Day Secondary School (GDSS), (iii) Government Secondary School (GSS), (iv) Girls Day Junior Secondary School (GDJSS), (v) Maryam Babangida Girls Science Secondary School, (vi) Ahmadu Bahago Boys Secondary School, (vii) Bosso Secondary School, (viii) Hilltop Model School, (ix) El-Amin International Secondary school, (x) Decs New College and Day Secondary school, Tudun Wada, (xi) Tunga Day Secondary School, (xii) Army Day Secondary School, Tunga, (xiii) Federal Government College and (xiv) Government Technical College Tunga, Minna.

## 2. Literature Review

Post-occupancy Evaluation is a method of measuring the performance of a building in use, with respect to the brief, the goals of the design team, and the activities and feelings of the users (Van Wagenberg, 1989; Zubairu, 2006). The building's occupants evaluate the suitability of the building to meet their particular needs (Barrett, 1995). The term Post Occupancy Evaluation (POE) was coined over 25 years ago and comprises all activities that originate out of an interest in learning how a building performs once it is built and occupied, including if and how well it has met expectations and how satisfied building users are with the environment that has been created. Precisely, Post Occupancy Evaluation involves systematic evaluation of opinions about buildings in use, from the perspective of the people who use them. Preiser, Rabinowitz & White (1988) further defined POE as a process of evaluating buildings in a systematic and rigorous manner after they have been built and occupied for some time. Many actors participate in the use of buildings, they include investors, owners, operators, maintenance staff, and perhaps most important of all, the end users. Post Occupancy Evaluation (POE) differs significantly from conventional surveys and market research. It uses the direct, unmediated experiences of building users as the basis for evaluating how a building works for its intended purpose.

There are three levels of POE: Indicative, investigative and diagnostic. The indicative POE is the first level carried out in a short period of time to determine whether there are serious problems in the building. The next level is the investigative POE which is carried out after an indicative POE has identified issues that need further investigation. The third level is the diagnostic POE which may take from several months to a year and the results are long-term oriented to improve not only a particular facility but also the state of the art in a given building type.

Facilities issues arise at all educational levels, from pre-kindergarten through postsecondary, and at all sites, from classrooms to administrative offices. Challenges arise in new and old facilities alike, although the types of concerns may differ (National Centre on Education Statistics, 2003). Facilities provision in schools is concerned with more than construction of building structures. It is also about creating a physical setting that is appropriate and adequate for learning, as well as providing clean and safe environments for children.

Post occupancy evaluation involves measuring the suitability and convenience of facilities through the following:

- (i) Systematic consideration of opinions of users about buildings in use
- (ii) Onsite inspection of existing infrastructure
- (iii) Prescribing possible means of improvement of these facilities

Equally, POEs are used for many purposes including;

- (a) Developing new facilities
- (b) Managing and improving on existing buildings
- (c) Establishing better building and maintenance standards.

### 2.1 Study Area

This research was carried out in Minna, Niger State. Niger state was created on 3<sup>rd</sup> February, 1976 when the then North-Western region was divided into Niger and Sokoto states. Presently, Niger state has the largest land area in Nigeria (76,363 km<sup>2</sup>) and has twenty-five local government areas. It is home to the Kainji and Shiroro hydro-electric dams, and the Kainji National Park. Minna, the state capital and the largest among the four major cities in Niger state is the main commercial and administrative centre. It is the home to a Federal University of

Technology, a College of Education, a School for Health Technology, and a substantial number of private and state owned primary and secondary schools. The fourteen secondary schools covered in this paper are located in the two local Government Areas (Bosso, and Chanchaga) in Minna.

### 3. Research Method

Stratified sampling method was used in the selection of the samples on Local Government Area (LGA) basis. Fourteen secondary schools (samples) were selected; seven schools were randomly selected from each of the two LGAs. The investigative method of POE was employed in gathering of data. The study investigated the physical condition of the buildings and their environs relative to the satisfaction of the staff and students necessary for the optimum academic performance for which the schools were established.

The schools were assessed using a well structured questionnaire as a quality indicator for the schools. A total number of five hundred and seventy four (574) questionnaires were distributed to the principals, teachers and students of the fourteen (14) schools (samples) selected. One each was distributed to the fourteen schools' principals, ten (10) each to the fourteen schools' teachers and thirty each to the fourteen schools' students. The questionnaires were distributed at random to all the schools' teachers and students.

The questionnaire was used to gauge various opinions to form a consensus of peoples' opinions. The assessment questions were grouped into three categories:

- (a) Provision of basic facilities
- (b) Quality of space
- (c) Staff and students' satisfaction.

The schools were assessed on the provision of basic facilities, some of which include the following:

- (i) Classrooms
- (ii) Offices and staff rooms
- (iii) Toilet facilities
- (iv) Sporting facilities, and
- (v) Library, laboratories, assembly hall, first aid and snack shop.

The performance of a school under any of the categories as aforementioned was obtained by the summation of scores obtained in the individual questions forming the basis for the assessment of performance in such category. Furthermore, comparison of each school's facilities with the documented standards was done. The documented standards is titled 'Guidelines on Minimum Standards of Schools' is the corrected version of an earlier document that was approved for publication and circulation by the Federal Inspectorate Service (FIS) at the 49<sup>th</sup> meeting of the National Council on Education (NCE) meeting in Kaduna, in 2002, which was amended and then approved at the 52<sup>nd</sup> NCE meeting of December, 2005. The section for the establishment of Junior and Senior Secondary schools was used for the scrutiny of the results obtained.

### 4. Data Presentation and Discussion of Results

#### 4.1 Provision of Basic Facilities

Table 1 displays the data obtained from the responses of principals, staff and students of the fourteen schools covered by the study in respect of provision of basic facilities. The schools were assessed on the provision of the following basic school facilities:

- (i) Classrooms
- (ii) Offices and staff rooms
- (iii) Laboratories
- (iv) Library
- (v) Assembly hall
- (vi) Sick bay/First aid
- (vii) Sporting facilities
- (viii) Toilet facilities and
- (ix) Snack shop

Table 1: Provision of Basic Facilities

S/No	School	Student (100%)	Staff (100%)	Principal (100%)	Total (300%)	Average (100%)
1.	Niger Baptist Secondary School (NBSS)	60	50	60	170	57
2.	Government Day Secondary School (GDSS)	50	60	65	175	58
3.	Government Secondary School (GSS)	55	55	55	165	55
4.	Girls Day Junior Secondary School (GDJSS)	50	50	50	150	50
5.	Maryam Babangida Girls Science Secondary School	80	75	85	240	80
6.	Ahmadu Bahago Boys Secondary School	75	90	90	255	85
7.	Bosso Secondary School	65	80	95	240	80
8.	Hiltop Model School	55	55	75	185	62
9.	El-Amin International Secondary school	80	95	95	270	90
10.	Decs New College and Day Secondary school, Tudun Wada,	50	60	70	180	60
11.	Tunga Day Secondary School,	45	50	60	155	52
12.	Army Day Secondary School, Tunga	25	30	40	95	32
13.	Federal Government College	50	65	75	190	64
14.	Government Technical College Tunga, Minna	45	45	50	140	47

In table 1 above, the grades scored by each school was calculated from the responses received. The total grades calculated represent the performance of each school in this category. The highest scoring school was El-Amin International School with a scoring of 90%, while the lowest scoring is Army Day Secondary School, Tunga with 32%. Meanwhile, all the schools' performances were within average and very good, in exception of Government Technical College Tunga, Minna and Army Day Secondary School, Tunga.

From the table 1 above, it is obvious that the responses of the students, staff and principals are fair enough. As for the students, in exception of three schools that are below average, all others are well above average. In the case of the staff and principals of the schools, responses of only two schools' staff and one school's principal fall below average.

#### 4.2 Quality of Space

The quality of space was also assessed along with the provision of basic facilities. The following are the parameters considered for it assessment,

- (i) Quality of lighting
- (ii) Quality of ventilation
- (iii) Quality of furniture
- (iv) Space area in classroom per student
- (v) Frequency of maintenance
- (vi) Premises' cleanliness

Table 2 shows the responses of students, staff and principals of the schools.

Table 2: Quality of Space

S/No	School	Student (100%)	Staff (100%)	Principal (100%)	Total (300%)	Average (100%)
1.	Niger Baptist Secondary School (NBSS)	90	70	60	220	73
2.	Government Day Secondary School (GDSS)	80	60	60	200	67
3.	Government Secondary School (GSS)	75	70	65	210	70
4.	Girls Day Junior Secondary School (GDJSS)	85	70	35	190	63
5.	Maryam Babangida Girls Science Secondary School	50	55	65	170	57
6.	Ahmadu Bahago Boys Secondary School,	25	30	40	95	32
7.	Bosso Secondary School	30	30	50	110	37
8.	Hiltop Model School	30	20	25	75	25
9.	El-Amin International Secondary school	100	90	95	285	95
10.	Decs New College and Day Secondary school, Tudun Wada,	85	80	70	235	79
11.	Tunga Day Secondary School,	20	25	30	75	25
12.	Army Day Secondary School, Tunga,	30	35	50	115	38
13.	Federal Government College	70	70	80	220	73
14.	Government Technical College Tunga, Minna	15	15	25	55	18

Data extracted from the questionnaire presented in table 2 above, indicates that El-Amin International School has the highest scoring of 95% and thereby top the list. On the other hand, Army Day Secondary School, Tunga, had 38% which is the lowest score. In general, the quality of space in six schools fell below average, while the eight others are well above average.

#### 4.3 Staff and Students' Satisfaction

In carrying out the Post Occupancy Evaluation (POE) of the schools students' satisfaction, the following parameters were used:

- (i) Comfort of seating arrangement
- (ii) Adequacy of class size
- (iii) Condition of toilet facilities
- (iv) Condition of the school premises

In addition, the staff and principals' satisfaction was measured based on the following parameters:

- (i) Salary satisfaction
- (ii) Availability of incentives
- (iii) Condition of toilet facilities
- (iv) Condition of the school premises
- (v) Staff development and
- (vi) Availability of teaching equipment

Table 3 shows the responses of students, staff and principals of the schools as regards their satisfaction of the schools' facilities and premises.

Table 3: Staff and Students' Satisfaction

S/No	School	Student (100%)	Staff (100%)	Principal (100%)	Total (300%)	Average (100%)
1.	Niger Baptist Secondary School (NBSS)	60	55	80	195	65
2.	Government Day Secondary School (GDSS)	40	35	65	140	47
3.	Government Secondary School (GSS)	60	50	60	170	57
4.	Girls Day Junior Secondary School (GDJSS)	70	55	70	195	65
5.	Maryam Babangida Girls Science Secondary School	65	65	75	205	68
6.	Ahmadu Bahago Boys Secondary School,	35	40	50	125	42
7.	Bosso Secondary School	55	50	70	175	58
8.	Hiltop Model School	50	55	55	160	53
9.	El-Amin International Secondary school	90	80	85	255	85
10.	Decs New College and Day Secondary school, Tudun Wada,	65	60	70	195	65
11.	Tunga Day Secondary School,	45	40	45	130	43
12.	Army Day Secondary School, Tunga,	25	25	40	90	30
13.	Federal Government College	75	80	80	235	78
14.	Government Technical College Tunga, Minna	15	15	30	60	20

From the responses in the questionnaire, El-Amin International School had the highest satisfaction scoring of 85% average, while Government Technical College Tunga, Minna had the lowest average satisfaction of the school facilities and premises.

## 5. Discussion of Results

From this study, it was found that six out of the fourteen schools covered performed creditably above average, while two schools fall below average (see table 4 below)

Table 4: General Performance of Schools

S/No	SCHOOL	Provision of Facilities (100%)	Quality of Space (100%)	Satisfaction (100%)	Total (300%)	Average (100%)
1.	Niger Baptist Secondary School (NBSS)	57	73	65	195	65
2.	Government Day Secondary School (GDSS)	58	67	47	172	57
3.	Government Secondary School (GSS)	55	70	57	182	61
4.	Girls Day Junior Secondary School	50	63	65	178	59

	(GDJSS)					
5.	Maryam Babangida Girls Science Secondary School	80	57	68	205	68
6.	Ahmadu Bahago Boys Secondary School,	85	32	42	159	53
7.	Bosso Secondary School	80	37	58	175	58
8.	Hilltop Model School	62	25	53	140	47
9.	El-Amin International Secondary school	90	95	85	270	90
10.	Decs New College and Day Secondary school, Tudun Wada,	60	79	65	204	68
11.	Tunga Day Secondary School,	52	25	43	120	40
12.	Army Day Secondary School, Tunga,	32	38	30	100	33
13.	Federal Government College	64	73	78	215	72
14.	Government Technical College Tunga, Minna	47	18	20	85	28

As shown in table 4 above, from the top, the six schools that stand above average include El-Amin International School, Federal Government College, Maryam Babangida Girls Science Secondary School, Decs New College and Day Secondary School, Niger Baptist Secondary School (NBSS), Government Secondary School (GSS), Girls Day Junior Secondary School (GDJSS), Bosso Secondary School, Government Day Secondary School (GDSS), and Ahmadu Bahago Boys Secondary School. The school with the lowest score of the four schools that performed below average was Hill Top Model School, and followed by Tunga Day Secondary School, Army Day Secondary School, Tunga, and Government Technical College Tunga, Minna respectively. The total grades calculated in table 4, represent the overall performance of each school in this study.

## 6. Conclusion and Recommendations

### 6.1 Conclusion

The results of the responses in the questionnaires were in most cases in conformity with the results of the physical investigation of the facilities. It is important to note that the first five leading schools as revealed by this study, El-Amin International School, Federal Government College, Maryam Babangida Girls Science Secondary School, Decs New College and Day Secondary School, Niger Baptist Secondary School (NBSS), Government Secondary School (GSS), Girls Day Junior Secondary School (GDJSS), Bosso Secondary School, Government Day Secondary School (GDSS), and Ahmadu Bahago Boys Secondary School, all have in common, namely, comfortable offices, good ventilation and lighting of the offices and classrooms, as well as good and well equipped laboratories. It must be stressed that the condition of facilities at El-Amin International School were generally excellent compared to those in the other schools. However, things like laboratories facilities, sporting facilities, landscaping and overcrowded classrooms were found to be in most cases inadequate in other schools. In addition, a major cause for concern in most schools visited was the provisions for sanitary facilities, especially for students with no provision in some cases and where there was any provision, it was grossly inadequate and in a terrible condition of disrepair.

In conclusion, from the study findings, the top five schools are all private secondary schools, except Federal Government College owned and maintained by the Federal Government of Nigeria, while the remaining nine are state Government owned schools. It further establishes that public schools are far less maintained than private ones.

### 6.2 Recommendations

Based on the findings of the study, the following are the suggested remedies towards forestalling future reoccurrence of the discovered problems,



- a) Condition of facilities at El-Amin International School is commendable. However, it is advisable that more toilet facilities be provided for the students. In addition, a continue adherence to the present maintenance principle is strongly advised.
- b) Decs New College and Day Secondary School and Niger Baptist Secondary School need to procure more land in order to incorporate more recreational facilities. Provision of more toilet facilities should be considered with addition of soft landscaping elements to the existing hard landscape in their premises.
- c) In general, especially for all the Government schools, due to overstressed facilities, it is recommended that additional structures be constructed and that future enrolment of students be scaled down in proportion to the available facilities.
- d) Most of the schools lacked a number of basic facilities such as laboratories, library and sport facilities. Thus, it is recommended that such facilities be provided by way of construction of new structures to accommodate them.
- e) The implementation of a landscaping scheme, both soft and hard is strongly recommended to improve the quality of the schools environment.
- f) Regular inspections of facilities and structures should be carried out by the school inspectorate team, with enactment and strict enforcement of redecoration and maintenance order to be issued by the team to any faulty secondary schools in the state.
- g) For secondary schools to be set-up in future by any operator, adequate visibility study should be made to obtain accurate population figures for likely enrolment and facilities provided should be scaled in proportion to these figures.

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